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Edward R. diGirolamo
Michael Torres
Thomas Trestain
INVENTORS

STUD SPACER WITH INTERLOCKING PROJECTIONS

COATS & BENNETT, P.L.L.C.
P.O. Box 5
Raleigh, NC 27602
(919) 854-1844

STUD SPACER WITH INTERLOCKING PROJECTIONS

FIELD OF THE INVENTION

The present invention relates to light metal stud walls and more particularly to a stud spacer adapted to be interconnected between respective studs forming a part of the wall structure.

BACKGROUND OF THE INVENTION

Metal studs are commonly used to form wall structures that can be load bearing or non-load bearing. Typically such wall structures include a plurality of metal studs connected between upper and lower metal tracks. Generally, the lower track is secured to a floor structure while the upper track is generally connected to an overhead structure. Wallboards and other types of interior wall materials can be secured to the sides of the studs. Metal wall structures are designed to withstand a variety of loads. For example, there can be load bearing loads imposed on the studs of the wall structure from an overhead load. Further, wall structures may be designed to withstand non-load bearing conditions such as wind and seismic loads. In any event, these load bearing and non-load bearing forces will generally act as vertical and horizontal loads on the wall studs. These loads, in some cases, can result in damage to the studs and the finishes secured to the studs if the wall structure is not properly braced.

This problem has been addressed in the past by providing lateral structural bracing to support the studs in the weak direction. Generally, such lateral structural bracing is secured to one side of the stud wall and directly to the studs and extends diagonally across the studs. However, such bracing structures are relatively expensive and require significant labor to install.

In other cases, it is known to include spacer bars extending through openings formed in the studs. However, many spacer bar designs are difficult to install and in the end do not yield substantial strength and rigidity.

Therefore, there has been and continues to be a need for a stud spacer system that is easy to install and which provides substantial strength and rigidity to the wall structure comprising the studs and which effectively aids the studs in withstanding both load bearing and non-load bearing forces.

SUMMARY OF THE INVENTION

The present invention relates to a stud spacer that is adapted to extend between two studs in a wall structure. The stud spacer includes a main member adapted to extend between the two studs with the main member including first and second end portions. A projection extends from each end portion. The projections of the main member are adapted to interlock with similar projections of other stud spacers so as to effectively interlock the stud spacer with adjacent stud spacers.

Further, in one embodiment of the present invention a stud spacer assembly is provided and which extends between a series of studs. The stud spacer assembly includes at least first and second stud spacers with the first stud spacer including a first projection and a second stud spacer including a second projection. When the two stud spacers are connected, the first and second projections interlock to connect the first and second stud spacers together. Each projection of the stud spacer includes a locking surface and a stop and wherein when interlocked, the locking surface of the first projection is engaged with the stop of the second projection and the locking surface of the second projection is engaged with the stop of the first projection.

Also the present invention entails a wall structure comprising a series of spaced apart studs with each stud having an opening formed therein. A series of stud spacers

extend between respective studs. Each stud spacer includes first and second projections that extend from opposite ends of the stud spacer. The first and second projections of each stud spacer are adapted to connect to first and second projections of other stud spacers so as to interconnect the stud spacers in the wall structure. Each projection includes a locking surface and a stop and wherein when connected the locking surface of the first projection is engaged with the stop of the second projection and the surface of the second projection is engaged with the locking stop of the first projection.

In one particular embodiment of the present invention, each projection includes a terminal end portion having the locking surface associated therewith, an opening and a stop or locking stop. When a pair of projections are interconnected, the terminal end of one projection is inserted through the opening of the other projection and the terminal end of the other projection is inserted into the opening of the one projection and the locking surfaces seat or rest against the locking stop which effectively interlocks the two projections together.

Other objects and advantages of the present invention will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of such invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a fragmentary perspective view of a portion of the wall structure showing the stud spacers of the present invention connected therein.

Figure 2A is a fragmentary schematic illustration showing the projections extending from a pair of stud spacers prior to the projections being interconnected.

Figure 2B is a view similar to Figure 2A but showing the projections being brought together prior to the projections being actually interlocked.

Figure 2C is a view similar to Figure 2B but showing a further progression of the projections being connected together.

Figure 2D is a view similar to Figures 2A-2C but wherein the two projections extending from the pair of stud spacers have been interconnected and effectively locked together.

Figure 3A is a schematic sectional view illustrating the two projections of a pair of stud spacers being brought together.

Figure 3B is a schematic sectional view similar to Figure 3A but wherein the interlocking process has advanced from that shown in Figure 3A.

Figure 3C is a schematic sectional view similar to Figures 3A and 3B but wherein the interlocking process is even further advanced.

Figure 3D is a schematic sectional view similar to Figures 3A-3C but wherein the two projections are disposed in an interlocked position.

DESCRIPTION OF EXEMPLARY EMBODIMENT

With further reference to the drawings, the stud spacer of the present invention is shown therein and indicated generally by the numeral **10**. In Figure 1 there is shown a wall section indicated generally by the numeral **20**. Wall section **20** includes a series of the stud spacers. Stud spacers **10** extend between a series of studs **24**. As seen in Figure 1, each stud includes a pair of flanges **24A** and a web **24B**. Formed in the web **24B** is an opening. As will be appreciated from subsequent portions of the disclosure, portions of the respective stud spacers **10** will project through the openings within the webs **24B** so as to effectively interconnect the stud spacers **10**.

Continuing to refer to Figure 1, each stud spacer **10** includes a main member or central section **30**. Central section **30** extends between a pair of side flanges **36**. Additional strength can be incorporated into the central section **30** by providing

elongated ribs (not shown) that maybe formed in the central section **30** and which run parallel with the flanges **36**.

Also, in the embodiment illustrated herein, each stud spacer **10** includes a pair of end flanges **34A** and **34B** disposed on opposite ends of the stud spacer. End flanges **34A** and **34B** extend in a plane generally normal to the plane of the central section **30**. As seen, the end flanges **34A** and **34B** are divided such that when the stud spacers **10** are incorporated in the wall structure **20**, the spacing between the flanges **34A** and **34B** will align with the openings formed in the webs **24B** of the studs **24**.

Flanges **34A** and **34B** can be secured by fasteners to the webs **24B** of the studs **24** that form a part of the wall structure **20**. Accordingly, each flange **34A** and **34B** includes an opening for receiving a fastener such as a screw. Screws are extended through the openings in the flanges **34A** and **34B** and into the adjacent webs **24B** so as to effectively anchor and secure each stud spacer **10** between two studs **24** as shown in Figure 1.

The above description of the stud spacer **10** simply describes one general design for the main portion or main member of the stud spacer. It is appreciated that the particular design of the central section or main member **30** can vary and that certain design features such as the flanges discussed above are not essential to the design.

Stud spacer **10** is designed such that when a series of stud spacers are incorporated into a wall structure **20** that the respective stud spacers can be interconnected together. To accommodate this function, the stud spacer **10** is provided with structure that enables the respective stud spacers to be linked or connected end-to-end when the stud spacers are employed within the wall structure **10**. In the embodiment illustrated herein, this interconnecting structure entails a projection or tongue that extends from opposite ends of each stud spacer **10**. As will be discussed in more detail below, when a series of stud spacers **10** are incorporated into a wall

structure **10** the individual projections will extend from one stud spacer to another stud spacer and interconnect with a similar projection associated with the other stud spacer.

As illustrated in the drawings, each stud spacer **10** includes opposite end portions and secured or formed on opposite end portions of each stud spacer is a pair of projections. This pair of projections is referred to as a first projection, indicated generally by the numeral **50**, and a second projection indicated generally by the numeral **80**.

With reference to Figures 2A-2B, the first projection basically comprises a tab or a tongue that extends outwardly from an end portion of the stud spacer **10**. First projection **50** includes a terminal end **52**. Formed on the terminal end is a locking surface and as will be understood from subsequent portions of this disclosure, the locking surface functions to engage a portion of another projection and this engagement will result in the two projections being interlocked or locked together. In the case of this embodiment, the locking surface formed on the first projection **50** is in the form of a locking tab **54**. Locking tab **54** is raised or elevated with respect to the upper surface of the first projection **100**.

Disposed inwardly of the locking tab **54** is an elongated reinforcing rib **56**. Rib **56** basically imparts strength and rigidity to the projection **50**. Disposed inwardly or towards the main section **30** of the stud spacer **10** is a transverse opening **58**. Disposed adjacent the opening is a deflector **60**. Deflector **60** in this embodiment is disposed on the inward side of the opening **58** and is directed downwardly as viewed in Figures 2A and 3A.

Disposed inwardly of the opening **58** and deflector **60** is a stop that may be sometimes referred to as a locking stop. As discussed above, the function of the projections **50** and **80** are to connect or interlock the respective stud spacers **10** together. The stop formed on the projections will cooperate with the locking surface described above to actually interlock or lock the two projections together. In the case of

this embodiment and with reference to the first projection **50**, the stop is in the form of an opening **62** that is sometimes referred to as a tab receiving opening **62** so as to distinguish the latter from opening **58**. In any event, the opening **62**, as viewed in Figure 2A, is of a general rectangular configuration.

Besides the first projection **50**, just described, each stud spacer will include the second projection **80**. Projections **50** and **80** will be disposed on opposite ends of each stud spacer **10**. The basic construction of the second projection **80** will be similar to the basic construction of the first projection **50**. However, in order that first and second projections may mate and interlock, it will be seen that the particular orientation of some of the components will be slightly different. In any event, second projection **80**, similar to first projection **50,** includes a terminal end **82**. Disposed inwardly of the terminal end is a locking surface in the form of a locking tab **84**. In this case, the locking tab **84** is indented into the surface of the second projection. Contrasted with the locking tab **54** of the first projection **50**, the locking tab **84** of the second projection **80** is raised with respect to the lower surface of the second projection **80**, as viewed in Figure 2A. That is the locking tab **84** projects downwardly from the underside from the second projection.

Like the first projection **50**, the second projection **80** includes a reinforcing rib **86**. The reinforcing rib **86** is disposed opposite the reinforcing rib **56** found on the first projection. Again, rib **86** will impart strength and rigidity to the second projection **80**.

Disposed inwardly of the rib **86** is a transverse opening **82**. Disposed on the inward side of the opening **82** is a deflector **90**. Note that deflector **90** extends upwardly at an angle on the second projection **80**. See Figures 2A and 3A. Finally, the second projection **80** includes a stop or locking stop. In particular, the stop is in the form of a tab receiving opening **92** that is formed adjacent the deflector **90**.

The first and second projections are of course arranged on the stud spacers such that when the stud spacers are aligned for connection, that a first projection **50** will be

disposed adjacent a second projection **80** for the purpose of interlocking or interconnecting the adjacent stud spacers. Basically to connect the first and second projections **50** and **80** together, one projection will be moved over the other and in the course of doing that the terminal ends **52** and **82** of the projections will contact the respective deflectors **60** and **90**. When the terminal ends **52** and **82** contact the deflectors, the construction of the projections will permit the terminal end portions of these projections to slightly flex. As the projections are continued to be pushed together, the terminal ends **52** and **82,** as a result of engaging the deflectors **60** and **90** will slightly turn and move through the openings **58** and **88**. Then as the projections are continued to be pushed together once the terminal end portions have reached a certain point the locking tabs **54** and **84** of the respective projections will tend to simply snap or move into engagement with the tab receiving openings **62** and **92**. This achieves a locked or interlocked condition.

With particular reference to Figures 2A-2D and 3A-3D, the locking or interlocking process will be described in more detail. In Figure 2A, a pair of stud spacers are spaced apart. Note the first projection **50** and the second projection **80**. In this situation, the projections are going to be brought together and interlocked. The first projection **50** will ride over the second projection **80**. This is illustrated in Figure 2B. As the two projections are continued to be brought together, the terminal end **52** of the first projection **50** will approach the upwardly directed deflector **90** of the second projection. Likewise, the terminal edge **82** of the second projection that underlies the first projection **50** will be approaching the downwardly oriented deflector **60** of the first projection.

Figure 2C illustrates the engagement of the terminal edge **52** with the deflector **90** and the engagement of the terminal edge **82** with deflector **60**. At the point illustrated in Figure 2C, the two projections cannot continue to move together unless the terminal end portions of the respective projections are deflected such that the terminal end

portions move through the respective openings **58** and **88** of the two projections. However, as noted above, the two terminal end portions of the projections will deflect and pass through the respective openings **58** and **88**. Once the terminal end portions have slightly cleared the openings **58** and **88**, then the tendency will be for the terminal end portions to spring back. This results, in the case of the first projection **50**, in the locking tab **54** snapping or moving into engagement with the tab receiving opening **92** of the second projection. When this happens, the two projections **50** and **80** are locked or interlocked together. That is the locking tab **54** will project upwardly into the opening or seat **92** and a locked condition will exist. Likewise the downwardly projecting locking tab **84** will snap into the tab receiving opening **62** formed in the first projection **50**. Once this happens another locked condition is achieved. Thus, there is a double locking of the two projections. This is illustrated in Figures 2D and 3D. This clearly forms a very tight and secure locking arrangement that will lock one stud spacer to another stud spacer.

It is appreciated that this locking and securing arrangement can be carried out continuously between consecutive stud spacers **10** and a wall structure **20**. That is, one stud spacer **10** after another stud spacer **10** is securely locked together by the locking mechanism just described.

The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the scope and the essential characteristics of the invention. The present embodiments are therefore to be construed in all aspects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.